THE DOCTOR SPEAKS, THE HEALTH SYSTEM LEARNS: VOICE DOCUMENTATION AS A FOUNDATION FOR AI-READY HEALTHCARE IN UZBEKISTAN

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Abstract

The introduction of artificial intelligence into healthcare requires more than advanced software. Its successful implementation largely depends on the availability, quality and accessibility of medical information. This paper examines how automatic speech recognition (ASR) could contribute to Uzbekistan's healthcare digitalisation and create favourable conditions for future AI applications. Drawing on experimental research involving 120 physicians in two medical institutions in Bukhara, the study identifies improvements in documentation efficiency, recorded information volume and physicians' acceptance of digital technologies. The findings suggest that voice-assisted documentation could become a practical starting point for developing more comprehensive electronic health records, strengthening medical information exchange and preparing healthcare institutions for AI-supported management. The paper proposes a gradual implementation approach that combines technological innovation, medical professionals' participation and data governance.

Keywords: healthcare digitalisation, artificial intelligence, automatic speech recognition, electronic health records, healthcare management, medical data quality, Uzbekistan.

Introduction

Over the past several years, the digital transformation of healthcare has become

an important component of Uzbekistan's national development agenda. Electronic health records, integrated information systems and digital platforms are expected to improve the accessibility and quality of medical services. Nevertheless, the practical success of these initiatives depends not only on government investments and technological infrastructure but also on the willingness and ability of medical professionals to use these systems effectively.

One issue that deserves greater attention is the process through which medical information enters digital databases. It may seem that the introduction of an electronic health record automatically makes healthcare information more accessible and useful. In practice, however, a digital system cannot provide meaningful information if doctors find the documentation process difficult, time-consuming or inconvenient.

This problem becomes particularly important when discussing the future application of artificial intelligence. AI-supported systems require reliable medical information for analysis, prediction and decision-making. Consequently, improving the way clinical information is collected should be considered an important preparatory stage of healthcare digitalisation.

The present paper argues that automatic speech recognition could play a connecting role between conventional electronic documentation and the wider adoption of AI-based technologies in Uzbekistan.

Research Methodology and Empirical Findings

The research was conducted within the framework of a doctoral investigation into improving healthcare management tools in Uzbekistan. A quasi-experimental approach was employed to examine the performance of automatic speech recognition in comparison with traditional keyboard-based medical documentation.

The study involved 120 physicians from two healthcare institutions in Bukhara. The experimental observations considered the time required for electronic record

completion, the amount of documented medical information, spelling inaccuracies and doctors' attitudes towards different input methods.

One of the most significant findings concerned documentation efficiency. The average time required to enter 100 medical words decreased from 8.8 minutes through manual typing to 5.2 minutes using ASR, representing a reduction of approximately 41%.

Another important result was the increased amount of documented information. The average electronic record expanded from 273 to 356 words, an increase of 30.4%. The findings also revealed a reduction in the average number of spelling inaccuracies from 16.7 to approximately 14 per record.

Equally important, 105 of the 120 participating doctors reported a positive experience with speech-assisted documentation. These findings suggest that simplifying the interaction between physicians and medical information systems may improve the practical acceptance of digital healthcare technologies.

However, the research also revealed persistent reliance on copied documentation. This observation confirms that technological improvements must be accompanied by appropriate organisational measures and changes in established working practices.

From Electronic Records to AI-Ready Medical Information

The wider significance of these findings extends beyond the time doctors spend typing. In our view, the most promising contribution of voice-assisted documentation lies in its potential to improve the availability of medical information that could eventually be used by more advanced digital systems.

First, ASR could contribute to the formation of more detailed patient histories. In conventional documentation, physicians may shorten descriptions because of time limitations or the inconvenience of keyboard entry. Voice recognition allows them to

document medical observations in a more natural manner. As demonstrated by the experimental results, physicians recorded considerably more words when dictating.

This is relevant because the effectiveness of future medical analytics depends partly on the information available in electronic records. More comprehensive documentation may provide additional information about patients' symptoms, medical histories and treatment processes. Nevertheless, an increase in word count alone cannot guarantee better clinical information. The content must be checked, clinically relevant and organised into appropriate data fields.

Second, improved documentation could support the development of national medical information systems. Uzbekistan's Digital Health Platform is being developed around international information-exchange standards, including HL7 FHIR. Its September 2026 implementation guide remains a draft, but it already establishes a direction towards consistent medical data representation and interoperability [2].

In this context, integrating speech recognition with electronic records could facilitate the collection of information at the clinical level, while standardised data structures could support its subsequent exchange between healthcare institutions.

Third, voice-based documentation could support the development of AI technologies adapted to Uzbekistan's linguistic environment. Medical terminology, professional expressions and regional differences in pronunciation create specific requirements for speech recognition. Continuous evaluation and carefully governed improvement of Uzbek-language medical speech technologies could therefore help establish locally appropriate digital solutions rather than relying exclusively on systems developed for foreign healthcare environments.

Future Opportunities for Artificial Intelligence in Healthcare Management

The potential applications of AI in healthcare are considerably broader than speech-to-text conversion. With properly organised and validated electronic

information, healthcare institutions may eventually introduce intelligent systems for administrative management, medical information analysis and clinical decision support.

For example, AI-assisted tools could help physicians identify missing documentation fields, prepare draft summaries of previous consultations or retrieve relevant information from a patient's electronic history. At the managerial level, aggregated and appropriately protected medical data could support analysis of patient flows, departmental workloads and demand for particular services.

Such applications could become especially valuable for regional medical institutions facing shortages of specialised personnel or substantial administrative workloads.

Recent international guidance also recognises the potential application of AI to clinical documentation and administrative functions. At the same time, the World Health Organization emphasises the importance of human oversight, reliable evaluation, privacy protection and accountability [3].

For Uzbekistan, this suggests that the introduction of AI should follow a gradual approach. Rather than immediately attempting to automate complex medical decisions, healthcare institutions could begin with relatively manageable applications, such as documentation assistance and administrative information processing.

The experience gained from these applications would help medical personnel develop confidence in the technology while allowing healthcare managers to evaluate its practical advantages and limitations. An important distinction must nevertheless be made: the present research demonstrates improvements in voice-assisted documentation. It does not establish that ASR alone improves diagnostic accuracy or that AI decision-support systems are already ready for nationwide deployment.

Managerial Implications for Uzbekistan

Based on the research results, several directions deserve consideration in the further development of national healthcare digitalisation.

The first is to recognise medical data creation as a managerial process rather than an exclusively technical task. The quality of a national electronic healthcare database ultimately depends on thousands of individual decisions made by physicians during daily consultations. Therefore, technologies intended to simplify documentation should be evaluated as part of healthcare management reform.

The second direction concerns the development of an integrated workflow in which doctors dictate medical information, verify the generated text and approve its inclusion in the patient's electronic record. Such a hybrid approach preserves professional responsibility while reducing unnecessary manual operations.

The third direction involves improving the compatibility of clinical documentation with national information standards. Once verified, relevant information could be organised using standardised classifications and terminology. Uzbekistan's work towards integrating ICD-11 into national digital systems demonstrates the importance already being placed on standardised health information [4].

Finally, the government and medical institutions should invest in continuous professional training. Although most participating physicians expressed satisfaction with ASR, differences in computer literacy, background noise and familiarity with new technologies remain practical obstacles. These challenges cannot be eliminated through software procurement alone.

A gradual implementation programme should therefore measure not only documentation speed but also the accuracy of records, frequency of physician corrections, completeness of relevant information, user satisfaction and protection of patients' personal data.

Conclusion

The findings of this research suggest that automatic speech recognition could contribute to Uzbekistan's digital healthcare transformation in ways that extend beyond faster medical documentation.

By simplifying information entry and encouraging more extensive record creation, voice-assisted technologies may help healthcare institutions develop better foundations for interoperable medical databases and future AI applications.

However, the transition from electronic documentation to intelligent healthcare management requires an additional level of organisational and technological development. Medical information must be verified, standardised, protected and evaluated before it can be used reliably in advanced analytical systems.

For Uzbekistan, the practical priority should therefore be to establish a strong relationship between medical professionals, digital information systems and national healthcare management objectives.

The central conclusion is that **the development of intelligent healthcare should begin with improving the quality of information generated during ordinary medical consultations**. AI may become an important tool for future healthcare management, but its effectiveness will depend on the reliability of the medical data on which it operates.

References

1. Teshayev, R. Q. *Improving Healthcare Management Tools in Uzbekistan Based on Foreign Experience*. PhD dissertation manuscript. Westminster International University in Tashkent.
2. Ministry of Health of the Republic of Uzbekistan. (2026). *Uzbekistan Digital Health Platform: FHIR Implementation Guide*, Version 0.10.0, draft dated 29 September 2026. https://dhp.uz/fhir/core/en/index.html
3. World Health Organization. (2024). *Ethics and Governance of Artificial*

Intelligence for Health: Guidance on Large Multi-Modal Models. Geneva: WHO. https://iris.who.int/handle/10665/375579

4. World Health Organization. (2025). *WHO Results Report 2024–2025: Uzbekistan Country Profile*. https://www.who.int/about/accountability/results/who-results-report-2024-2025-eob/country-profile/2025/uzbekistan
5. Blackley, S. V., Schubert, V. D., Goss, F. R., et al. (2020). Physician use of speech recognition versus typing in clinical documentation: A controlled observational study. *International Journal of Medical Informatics, 141*, 104178. https://doi.org/10.1016/j.ijmedinf.2020.104178